

Thallium

Function: Differential Pulse Stripping Voltammetry (DPS/a)

Start Potential (mV)	-800
End Potential (mV)	-200
Current range	2,048
Scan Speed (mV/s)	20
Deposition time (s)	60
Deposition Pot. (mV)	-900
Number of cycles	3
Delay before sweep (s)	5
Purge and stir time (s)	300
Stirring speed (rpm)	300
Drop Size (a.u.)	60

Thallium concentrated standard solution (1 g/l)

Dissolve 1.303 g of pure TlNO₃ in 1 l of distilled water in a volumetric flask. (MM_{TlNO₃} = 266.373; MM_{Tl} = 204.37).

Supporting Electrolyte

1 – Tartrate buffer 1 M, pH 8.5 - 9

Dissolve 1.5 g of tartaric acid in 50 ml of distilled water. Add 26% NH₃ until pH 8.5 - 9. Bring to volume with distilled water, in a 100 ml volumetric flask Store in polyethylene bottle.

2 – 0.1 M EDTA – di sodium salt solution

Dissolve 37.2 g of EDTA-Na₂ in 1 l of distilled water in a volumetric flask.

Procedure for Tl, Cu and Pb low content samples

Dry 10 ml of the sample at 110°C, in a oven. Add HNO₃ or HClO₄ and dry again. Repeat the treatment until the residue is white. Add 10 ml of tartrate buffer and 200 µl of EDTA solution.

Procedure for Tl, Cu and Pb high content samples

Pour 10 ml of tartrate buffer in the cell, add 1 – 2 ml of sample and 200 µl ml of EDTA solution. Adjust pH by using 26% NH₃, and measuring the added amount of the latter.

Analytical Report

Analysis: poisoned wine

Sample Concentration (dilution=1000) = 6.52 mg/l

Method: 3 additions

Volumes Table

Solvent Volume	0 (ml)
Supporting Sol.	10.2 (ml)
Sample Volume	0.2 (ml)
Sample Volume	10 (mg/l)

Height Table

#	Peak Pot.	Height
0	-536.8	496.1 nA
1	-533.8	884.1 nA
2	-533.8	1.212 μ A
3	-530.8	1.606 μ A

Regression Data

#	Add. Conc.	Height x dilution
0	0 mg/l	25.80 μ A
1	5.00 "	46.42 μ A
2	10.00 "	64.26 μ A
3	15.0 "	85.96 μ A

$$y = ax + b$$

$$a = 3.966 \mu\text{A} \cdot \text{l}/\text{mg}$$

$$b = 25.86 \mu\text{A}$$

$$r^2 = .9987$$

